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PROCRASTINATION IN ADULTS WITH ADHD

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Pablo Almeida Rocha[1], André Luiz de Almeida Martins[2], Ana Flávia Moura Marques[3], Juliana Ribeiro Costa[4], Lavinia Barbosa da Terra Perigolo[5], Maria Gabriela Pinheiro Pereira[6], Mariana Severo Monteiro[7] and Milagres Araújo Nascimento[8]

ABSTRACT

This article addresses the relationship between procrastination and attention deficit hyperactivity disorder (ADHD) in adults, exploring underlying neurobiological, cognitive, and emotional factors. Using a narrative review of the literature, the work analyzes how deficits in executive functions, difficulties in emotional regulation, and altered reward patterns contribute to procrastination in this population. Procrastination in adults with ADHD is not a formal symptom of the disorder. Still, it is strongly associated with it, being influenced by difficulties in planning, organization, impulse control, and time management. Difficulties with time perception and the search for immediate gratification, common in individuals with ADHD, increase the likelihood of task postponement. In addition, emotional factors, such as anxiety, perfectionism, and avoidant automatic thoughts, intensify this behavior. The impacts of procrastination go beyond the individual, affecting their academic, professional, and social life, and increasing the risk of comorbidities such as depression and anxiety. Regarding treatment, cognitive behavioral therapy (CBT) is the most effective approach, promoting changes in perception and procrastinatory behavior through cognitive restructuring and the development of coping strategies. Online CBT emerges as a promising alternative to increase accessibility to treatment. It is concluded that procrastination in adults with ADHD is a phenomenon that involves several elements, requiring specific therapeutic approaches to mitigate its negative impacts and improve the quality of life of these individuals.

[1] Psychiatrist
University Center of Brasília (CEUB)
E-mail: pablo.rocha@ceub.edu.br
[2] Master's Degree in Psychology
State Department of Health of the Federal District (SES-DF)
E-mail: andreluiz.am@gmail.com
[3] Medical Student
University Center of Brasília (CEUB)
E-mail: ana.marques@sempreceub.com
[4] Medical Student
University Center of Brasília (CEUB)
Email: juliana.ribeiroc@sempreceub.com
[5] Medical Student
University Center of Brasília (CEUB)
E-mail: lavinia.perigolo@sempreceub.com
[6] Medical Student
University Center of Brasília (CEUB)
E-mail: maria.gp@sempreceub.com
[7] Medical Student
University Center of Brasília (CEUB)
E-mail: mariana.monteiro@sempreceub.com
[8] Medical Student
University Center of Brasília (CEUB)
E-mail: milagres.araujo@sempreceub.com

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INTRODUCTION

Attention deficit hyperactivity disorder (ADHD) is a neurodevelopmental disorder characterized by inattention, hyperactivity, and impulsivity. Although often diagnosed in childhood, ADHD persists into adulthood for a significant portion of affected individuals, impacting several aspects of their lives, including academic and professional performance (Palmini, 2024).

Procrastination is a significant challenge for many adults, but it is particularly prevalent and intense among those with ADHD, yet it is not considered a symptom of this disorder. Existing literature suggests that procrastination in this population results from a complex interplay of factors, including difficulties with attention, executive functions, motivation, and emotion regulation (Palmini, 2024).

The executive functions affected by procrastination are mainly planning, organizing, and time management – skills that adults with ADHD already have an inherent difficulty with, making the process of dividing tasks, prioritizing responsibilities, and following schedules challenging (Oscarsson *et al.,* 2022). As a result, procrastination in adults with ADHD is often associated with high levels of emotional distress. Chronic stress and anxiety resulting from missed deadlines and the backlog of tasks can significantly impact mental health, contributing to a higher likelihood of comorbidities such as depression and anxiety (Oguchi *et al*., 2021). The cyclical nature of this relationship, in which procrastination generates suffering, which, in turn, further fuels procrastination, intensifies the suffering of those affected.

The effects of procrastination go beyond the individual, impacting their social functioning and relationships. The recurrent difficulty in fulfilling commitments, whether personal or professional, can generate tension in relationships with family, friends and co-workers, and can intensify the social stigma and discrimination that these individuals already naturally face due to neurodevelopmental disorder. In addition, chronic stress and anxiety associated with procrastination can lead to social isolation and withdrawal from social interactions, further deepening the severity of these impacts (Oscarsson *et al.*, 2022).

This study offers a narrative review of the existing literature on the prevalent relationship between procrastination and ADHD in adults, with the aim of exploring and discussing the relationship between these situations, seeking to deepen the understanding of this complex relationship, contributing to the dissemination of the importance of proper diagnosis and more effective interventions that can mitigate the negative impacts associated with adult individuals with ADHD.

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UNDERSTANDING PROCRASTINATION

There are many ways to define procrastination, although most concepts overlap and have common structures, especially highlighting the intentional but irrational nature of procrastination. Some studies define it more for a conscious aspect of the spectrum, as being the voluntary postponement of planned actions, even when there is awareness that this postponement is likely to result in negative consequences (Dong *et al*., 2022; Rozental *et al.*, 2022). Others emphasize the other side of the spectrum, highlighting the irrationality of this postponement, underlining the expectation of loss resulting from the postponement, suggesting a difficulty in controlling actions (Zentall, 2021).

In view of the myriad of concepts, it is clear that procrastination is a complex phenomenon that goes beyond a simple definition, with a heterogeneous nature of multiple causes and different typologies of procrastination (Rozental *et al.*, 2022). Svartdal and Lokke advocate for an ideographic approach, emphasizing the need for personalized strategies to understand and address procrastination, considering its individual and dynamic nature (Svartdal and Lokke, 2022). This detailed perspective requires analyzing not only the act of procrastinating, but also the underlying motivations, emotional responses, and cognitive processes involved.

The psychological and emotional aspects of procrastination are widely explored in the literature. Several studies bring procrastination with a direct relationship to anxiety and guilt (Rozental *et al*., 2022; Turato and Santos, 2022), creating a vicious cycle in which anxiety in the face of unfinished tasks leads to even greater procrastination. This process is further complicated by the activation of defense mechanisms, such as self-preservation strategies to avoid responsibility (Turato and Santos, 2022). Sommantico *et al.* (2024) investigate the relationship between procrastination, perfectionism, and narcissistic vulnerability, suggesting that socially prescribed perfectionism, influenced by perceived parental expectations and criticism, can significantly contribute to procrastination. In addition, narcissistic vulnerability would act as a mediator in this relationship.

Emotion regulation plays a key role in this context. Schuenemann *et al.* (2022) demonstrate that improving emotional regulation skills can significantly reduce procrastination, which could show a predominance of this emotional aspect in the control of this process, to the detriment of rational will. Corroborating this hypothesis, Li *et al*. identified the right dorsolateral prefrontal cortex as a key area that influences both emotion regulation and procrastination. Difficulty in emotion regulation is directly linked to higher levels of procrastination, suggesting that the inability to cope with aversive emotions is a

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significant factor for this behavior (Li *et al.*, 2024). This relationship is also reinforced by Govindan *et al.* (2024), which identify evaluation anxiety, low self-esteem, and perfectionism as common causes of procrastination among college students.

An interesting aspect is brought up by Dong *et al.* (2022), which point out the relationship between sensitivity to punishment and procrastination, identifying that higher levels of sensitivity to punishment result in greater procrastination. Their study identifies neural substrates, with an emphasis on the caudate nucleus and the prefrontal cortex, as critical areas for this behavior. This is compatible with the hypothesis that emotional hyperreactivity (related to difficulty in emotional regulation) linked to a diminished feeling of self-confidence is linked to procrastination.

The temporal aspect of procrastination is crucial. Zentall (2021) highlights the concept of "time discount", in which smaller and immediate rewards are preferred to larger rewards in the future, as well as "time avoidance", where individuals postpone until the last moment to avoid negative consequences. Codina *et al.* (2024) analyze the influence of temporal perspectives (attitudes towards the past, present, and future) on procrastination, identifying that when the person has a positive perspective on the future, less procrastination occurs, and when the person has a more negative perspective on the past (and from there a widespread feeling of pessimism about personal capacity) there is greater procrastination. Delving deeper into this relationship, it is evident that the temporal dimension of procrastination is not that simple: it is not just a postponement of tasks, but involves the interaction between the construct that the person makes of his past, immediate gratification, long-term consequences and the individual's own perception of time.

Zhang *et al. (2023)* provide empirical evidence for a triple model of the anatomical network of the brain associated with procrastination, relating it to dysfunctions in self-control, emotion regulation, and episodic prospecting. Their longitudinal study reveals something that seems logical from a rational point of view, but interesting when verified in studies: the more functional the relationship between self-control, emotional regulation (specifically reappraisal) and episodic prospecting, the lower the intensity of procrastination.

Episodic prospecting refers to the cognitive process of mentally simulating future events, drawing on personal episodic memories to construct detailed and vivid scenarios (Zhang *et al.*, 2023). This process involves imagining oneself engaged in specific future actions, experiencing the emotions and associated sensory details, and is a form of future-oriented thinking that allows individuals to anticipate potential outcomes and plan accordingly (Zhao *et al.*, 2024). In essence, episodic prospecting functions as a mental time

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travel mechanism, connecting the present to the future, making it possible for individuals to prepare for future events and guide their current decisions (Kashiwakura and Hiraki, 2024). This mental simulation differs from other ways of thinking about the future that can be more abstract or less emotionally charged.

Studies suggest that individuals with a greater ability to engage in episodic prospecting – i.e., vividly imagining themselves completing a task in the future – are less likely to procrastinate (Zhang *et al*., 2023; Zhao *et al*., 2024). But, since procrastination is a complex phenomenon, this relationship is not so simple. A strong ability to visualize the future can be beneficial, but if accompanied by poor emotional regulation, it can paradoxically increase the likelihood of procrastination; The individual sees himself finishing the task, but he is unable to regulate himself to structure the path of the task to its completion. This suggests that simply honing episodic prospecting may not be enough to reduce procrastination; interventions should also address the underlying emotional dysregulation (Zhang *et al*., 2023).

RELATIONSHIP OF PROCRASTINATION WITH ADHD

One of the most common problems faced by adults with ADHD is procrastination, which has an undeniably significant impact on their daily lives and overall functioning (Oguchi *et al*., 2021). Studies have consistently demonstrated a strong association between ADHD symptoms and procrastination, suggesting a complex interaction between the neurobiological underpinnings of the disorder and the behavioral manifestation of procrastination (Muller *et al*., 2023).

The severity of ADHD symptoms appears to influence the extent of procrastination (Oguchi *et al*., 2021). This suggests that the core deficits in attention, executive function, and impulse control, characteristic of ADHD, directly contribute to procrastination behaviors. Difficulty prioritizing tasks, managing time effectively, and resisting immediate gratification from less demanding activities—common aspects of ADHD—can lead to significant delays in task initiation and completion (Palmini, 2024). In addition, the relationship between procrastination and ADHD seems to intensify under reward conditions (Oguchi *et al*., 2023), highlighting the role of deficits in reward processing in ADHD as a driving factor for procrastination.

Several cognitive and neurobiological factors may underlie the relationship between procrastination and ADHD in adults. Time discounting, i.e., the tendency to devalue future rewards compared to immediate rewards, is a central cognitive mechanism implicated in

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procrastination (Zhang and Ma, 2024). Adults with ADHD often have higher rates of time discount, which leads them to prioritize immediate gratification over long-term goals. This preference for immediate rewards makes it difficult to initiate and persist with tasks whose gratification is postponed - which is one of the main aspects of procrastination (Oguchi *et al.*, 2023).

In addition, deficits in executive functions (EFs), including working memory, inhibitory control, and cognitive flexibility, are central to the neurobiology of ADHD (Afshadi *et al.*, 2024). These deficits in EFs directly compromise the ability to plan, organize, and execute tasks efficiently, further contributing to procrastination (Kamradt *et al.*, 2019). Difficulties in time management, a crucial aspect of executive functions, are widely reported by adults with ADHD and are directly associated with procrastination, which is further aggravated by the decreased ability to divide extensive tasks into smaller, more manageable steps, as well as difficulty in setting priorities (Kwon *et al.*, 2018).

The prefrontal cortex (PFC), a brain region essential for executive functions and future-oriented thinking, exhibits a delay in maturation in individuals with ADHD (Leisman and Melillo, 2022). This immaturity in the CPF can contribute to "inattention to the future", a situation often observed in adults with ADHD, resulting in a reduced ability to connect present actions with future consequences, an essential factor in procrastination. In addition, deficits in reward processing, also linked to PFC dysfunction, may further exacerbate this problem, since individuals with ADHD may have difficulties experiencing the anticipated satisfaction of completing a task, thereby reducing motivation for timely completion of activities (Leisman and Melillo, 2022).

Other complicating elements, often comorbid with ADHD, can also significantly influence procrastination behaviors. For example, depression and anxiety are conditions that are often associated with ADHD (Oguchi *et al.*, 2021; Muller *et al.*, 2023), and can substantially aggravate procrastination. Depression can lead to decreased motivation and energy levels, making it even more difficult to initiate and complete tasks (Kwon *et al.,* 2018). Anxiety, on the other hand, can generate avoidance behaviors, leading individuals to postpone tasks that they perceive as stressful or challenging (Barel *et al.*, 2023). The interplay between ADHD symptoms, depression, and anxiety creates a complex network of factors that contribute to procrastination.

Avoidant automatic thoughts (EAPs), which precede or accompany delays in task initiation or completion, also play a significant role. Adults with more severe ADHD symptoms report a higher frequency of ECPs, which leads to an increase in task avoidance.

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These thoughts often involve negative self-evaluations, fear of failure, and unrealistic expectations, all factors that can fuel procrastination behaviors. The frequency of EAPs appears to be directly related to the severity of ADHD symptoms, emphasizing the importance of addressing these cognitive distortions in interventions targeting procrastination (Barel *et al*., 2023).

In addition, the methods of procrastination can vary among individuals with ADHD, and so can their potential approach. Research suggests that passive procrastination (postponing tasks without the real intention of completing them) is significantly related to ADHD symptoms and, therefore, has a greater potential for improvement when actively treating the individual's ADHD condition (with specific pharmacological and non-pharmacological measures). On the other hand, active procrastination (intentionally postponing tasks with the intention of completing them later) has less to do with ADHD symptoms, and thus an additional approach and separate attention is required (Muller *et al.*, 2023).

Smartphone addiction, academic boredom, and low self-esteem are other factors that have been shown to be significantly related to ADHD symptoms in the context of procrastination. These factors can create distractions, reduce motivation, and decrease self-efficacy, thus contributing to an increase in procrastination behaviors (Muller *et al.*, 2023).

ADDRESSING PROCRASTINATION IN ADULTS WITH ADHD

Cognitive-behavioral therapy (CBT) consistently emerges as the most suitable approach to deal with procrastination in adults with ADHD (Lopez *et al.*, 2018; Solanto and Scheres, 2020; Nasri *et al*., 2023). The effectiveness of CBT stems from its ability to address the cognitive distortions and maladaptive behaviors that underpin procrastination. For example, CBT helps individuals identify and challenge negative automatic thoughts (such as "I'll do it later, that's okay" or "I'm not good enough to complete this task anyway, there's no point in even starting") that often precede procrastination. By replacing these negative automatic thoughts with more realistic and adaptive thoughts, CBT facilitates a behavioral change (Knouse *et al.*, 2025).

The method of application of CBT also seems to influence its effectiveness. The reviewed studies explored both face-to-face CBT and web-based CBT (named iCBT by the study). While face-to-face CBT offers the advantage of direct interaction with a therapist, iCBT provides greater accessibility and flexibility, which can increase treatment adherence,

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especially for individuals who face difficulties attending face-to-face sessions. Nasri *et al.* (2023) demonstrated the efficacy of iTCC in reducing ADHD symptoms and maintaining these reductions over 12 months. This suggests that iCBT may be a valuable option for addressing procrastination in adults with ADHD, especially those who face geographic limitations, scheduling challenges, or other accessibility issues.

Group CBT-based interventions offer a unique advantage by providing a supportive environment in which individuals can share experiences, learn from each other, and receive peer support. The group environment can be particularly beneficial for individuals with ADHD, as they can benefit from the structure offered by group therapy and the social reinforcement it provides. However, it is necessary to consider the possible challenges of group therapy, such as the demands of a generally longer time and the need for social interaction (Norbdy *et al.*, 2021).

As mentioned earlier, many individuals with ADHD face difficulties related to executive functions such as planning, organizing, and time management. Interventions aimed at improving these functions can indirectly address procrastination by providing individuals with the skills they need to manage their tasks effectively. Solanto and Scheres demonstrated the feasibility and effectiveness of a CBT program specifically aimed at temporal awareness, distraction, and planning difficulties in college students with ADHD. Interventions focused on improving executive functions can include a variety of techniques, such as time management training, organizational skills training, and goal-setting strategies (Solanto and Scheres, 2020).

Emotional dysregulation is another significant factor contributing to procrastination in adults with ADHD. Negative emotions, such as anxiety, frustration, or emotional overload, can trigger procrastination as a form of avoidance. Interventions that promote emotion regulation skills can help individuals manage these emotions effectively and reduce the likelihood of procrastination (Knouse *et al.,* 2025). Techniques such as mindfulness, relaxation training, and stress management strategies can be incorporated into treatment plans to strengthen emotion regulation (Nasri *et al.*, 2023; Stralin *et al.*, 2024).

While medication alone is not typically sufficient to deal directly with procrastination, it can play a crucial role in managing the ADHD symptoms that contribute to this behavior. Stimulant medications, for example, can improve attention, focus, and impulse control, making it easier to initiate and complete tasks (Lopez *et al.*, 2018). However, it is essential to highlight that the medication should be used in conjunction with other therapeutic approaches, such as CBT, rather than being an isolated treatment. The combination of

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medication and therapy provides a synergistic effect, addressing both the neurological underpinnings of ADHD and the maladaptive behaviors associated with procrastination (Lopez *et al.*, 2018).

FINAL CONSIDERATIONS

The evidence reviewed throughout this article demonstrates that there is a strong association between procrastination and ADHD in adults, and that this phenomenon has several particularities and involves a complex interaction between difficulties in executive functions, emotional regulation, reward processing, and temporal perspective. Adults with ADHD have a marked tendency to procrastinate due to deficiencies in time organization, planning, and management, as well as emotional difficulties that amplify the negative impacts of this behavior.

The feedback loop of procrastination generating greater psychological suffering, which in turn intensifies procrastination, indicates the importance of effective therapeutic approaches to mitigate its deleterious effects. The literature indicates that strategies based on Cognitive-Behavioral Therapy (CBT), both face-to-face and online, are effective in reducing procrastination, especially when addressing dysfunctional automatic thoughts and promoting strategies for the improvement of executive functions. In addition, the application of CBT in a group can offer additional support by enabling the exchange of experiences between individuals with similar difficulties.

Interventions that aim to improve emotional regulation and increase temporal awareness can also be beneficial, since the difficulty of visualizing the impact of present actions in the future contributes to the postponement of tasks. Specific programs that help develop planning skills and strengthen self-control can contribute significantly to reducing this behavior, increasing the functionality and quality of life of adults with ADHD.

Therefore, this study reinforces the importance of promoting awareness about the impact of this phenomenon to reduce stigma and enable more adequate support for this population. A greater understanding of this topic and, consequently, more effective action to improve procrastination will allow better therapeutic outcomes and an improved quality of life for adults with attention deficit hyperactivity disorder.

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